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PAPER

IN

AGRICULTURE.

HOEING WHEAT.

The Thanks of the Society were voted to Colonel J. Le Couteur, of the Island of Jersey, for the following paper on Hoeing Wheat.

In a small work published by me, "On the Varieties, Properties, and Classification of Wheat," I state that it is of paramount importance, in order to obtain the largest amount of produce, that the seed should be pure; that is to say, of one sort or variety, in order to secure a uniform and perfect state of ripeness; for I have distinctly established, that the proper portion of farina, or meal, cannot be obtained from a crop containing a vast variety of sorts — where some, at the moment of reaping, which the farmer judges of from the largest portion being ripe, may be half ripe, some still less so, and some even in a green state.

Under such circumstances, it is impossible to expect that most corn will be ripened, or the largest portion of flour obtained from such corn, or that it will afford the greatest quantity of bread.

I am aware of the fact, that wheat should not be over ripe in order to produce most meal, but this applies equally to a pure crop; indeed more so, as more will be obtained from such than from one that is indiscriminately mixed.

This principle being admitted, I wish to bring forward some further observations, which the experience of two additional years has afforded me, relating particularly to the proper moment for hoeing wheat.

I trust that circumstances, which may appear trivial at first sight, may not be tedious to listen to; but I truly believe that the proper cultivation of wheat is yet little understood, and I feel that every advance should be developed and promulgated as speedily as possible, in order to promote the blessings derived from agriculture, and to extend knowledge: indeed, one who could keep secret any advantages proceeding from it, would little deserve either the inestimable blessings conferred by a gracious Providence, or its protecting hand.

It has not been unusual to hear intelligent farmers object to hoeing wheat, because they found that it injured the growth of the plants; an objection perfectly correct, as long as they worked without a proper knowledge of the mode of growth of wheat: for they frequently did, and do still, greatly injure the crop by injudicious hoeing.

There are two sets of roots to wheat, and therefore this grain should be sown at a depth sufficient to separate their offices, which I hold to be distinct.

A grain of wheat, sown at a depth of three inches, that which I adopt, usually appears above ground, in ordinary favourable seasons, in nineteen days.

By observing the dried specimens now exhibited, it will be seen that No. 1, sown at the above depth on the

23d of January, was, on the 25th of April or at the end of ninety-two days, still depending on its lower or terminal roots for support: it had not yet put forth the upper or coronal roots; but a small dark ring indicates the point from which they would have protruded, about one inch below the surface. This small joint between the two sets of roots is named the pipe of communication. On the 4th of May, specimen No. 2 will shew you that, in one hundred and two days, the two coronal roots had protruded laterally about a quarter of an inch.

It seems that nature, by affording this pipe of communication between the coronal and seminal roots, clearly intended them to perform different offices; the lower set nourishing the plant from sources drawn from below, the upper ones from the influences of the atmosphere, hoeings, or top-dressings. What more beautiful and interesting provision can be found for the healthy support of a plant, so necessary to the very existence of man?

The coronal roots begin to shoot laterally in about eighty days after the plant has appeared above ground in ordinary seasons, it being impossible to fix a precise time, as allowance must be made for climate and seasons. If these coronal roots, on emerging to perform their office, find themselves in a hard dry soil, surrounded by the roots of millions of weeds; that the leaves by which the plant breathes are overwhelmed by a multitude of enemies in the form of weeds of every description, which deprive the young and tender plants of the pure atmosphere they should inhale, and probably impart to it themselves gases of qualities noxious to the wheat; it necessarily follows, that the plant cannot thrive as it should do, and that it must be checked at this period of its growth. Now, this is the precise fact. Let any observant person look to his wheat at this period; let him take up some of the plants carefully, he will perceive these coronal roots; let him observe further, he will, as the weeds advance, see his crop changing from a healthy green to a yellow sickly colour, which it may only recover when the roots have gained strength, and, in some cases, the plants have got the better of the weeds; in others, the weeds will get the mastery of the coronal roots, and the return may be a half crop, if not less. I have experienced this myself; but what is the contrary case? If, at the period that these coronal roots are just to emerge, a deep, careful, and rapid hoeing be given them, the whole of their enemies, the weeds, are checked—the roots shoot into a soil recently stirred for their reception—the plants revel in a pure atmosphere and breathe freely, besides possessing the undivided enjoyment of dews, refreshing showers, and the influences of light. The same observer will perceive the sudden and extraordinary change that will soon take place; the plants will lose their sickly hue, and they will rapidly expand, or trail along the ground.

By looking to Plant 3, it will be seen that, at the end of 114 days, the coronal roots will have made considerable progress; and that, in a fortnight more, they appear greatly developed, as in Plant 4. I will here call your attention to the fact, that, as the plants begin to tiller, the pipe of communication would appear to lessen in volume, dwindling, in the end, as it were, into a mere thread; the coronal roots, also, begin to develope themselves in a greater degree than the seminal roots. I consider I have demonstrated the importance of examining a few plants, in order to watch for the proper period for the first hoeing. To press it further, it may, however, be added, that though wheat, in ordinary favourable seasons, is from seventeen to nineteen days in appearing, from the period of sowing this season, owing to extreme coldness, some of my wheat, sown a week before Christmas, was forty-five days in the ground before it appeared, although it had been regularly pickled and soaked: it is proper to add, it was seed I obtained from England, and might have been two years old, which would have retarded its growth in a slight degree. Where land is in a foul state, a second hoeing is important; but this, it is considered, should be exceedingly light and superficial, merely to skim off any weeds that may have sprung up since, or have escaped the first hoeing, in order not to cut or disturb the coronal roots which, at the end of 144 days (Specimen 5), will have extended themselves across the drills, whether of seven or nine inches. The hoe used for this purpose is of my own construction; it is in the form of a stirrup, the sides being rounded off in order to guide the workman in making his strokes rapidly: for, by this means, the round side may rub along the wheat without injuring it, and the blade being of a razor shape, and as narrow, is both strong and cutting, accumulating no soil, and meeting with little resistance; it is a pleasant and efficient instrument. If the workman steps backwards, he leaves the weeds untrodden to wither rapidly. A man can hoe four drills at each pace conveniently; and, where the land is not foul, he should hoe half an acre in a day. I frequently get the work done at so much per drill, after having ascertained the time required to hoe the first four drills, so that a just quantum of labour can be exacted, and the labourer earn more or less, according to his industry. By walking forward the labourer will execute more work, but he then treads down the weeds into the freshly stirred soil, which is also thereby considerably consolidated. This description of hoe is also strongly recommended for all sorts of drilled crops, as it enables a workman to scoop out a weed from the edge of an onion, or other plant, without incurring the risk of cutting it, — an inconvenience constantly attending the use of ordinary Dutch or other hoes, if used rapidly.

On poor soils requiring much manure, an application of diluted, recent liquid manure, will be found highly beneficial just after the first hoeing, as the young shoots will absorb a due share of nourishment from it, while, by the destruction of the weeds, the roots of most of them will afford additional food for the wheat plants.

For the same reason that it is proper to free the young plants from weeds when the coronal roots begin to shoot, I hold it to be a doubtful practice, then, to sow grass seeds.

If the ensuing fortnight be mild and moist, the young clovers and grasses will have put forth leaves, which are so many millions of mouths, breathing the atmosphere at the expense of the wheat plants, besides taking from them much nutriment.

I had a remarkable instance of this on my farm last season. A field of wheat was looking beautiful after its first hoeing, I had sown a large portion of artificial grasses over it, imagining the coronal roots would gain ground over them; but a fortnight of genial weather wrought a sad change — the little grasses came on charmingly, but the poor wheat changed into a "yellow and settled melancholy," and never recovered itself; the ground had been so well manured that the sample proved fine, but the crop did not reach above twenty-six bushels per acre, where I should have obtained forty, and the straw was shorn of half its length.

The result was different by sowing the grass seeds at the second hoeing, which I tried in another field, a fortnight or three weeks' additional growth having enabled the coronal roots to take a firm hold of the soil; nor did the crop appear to receive a check at the period when the grass seeds developed themselves.

The produce, in this case, was only thirty-five bushels per acre; but that the grain did not suffer here is proof, by the beautiful sample, I venture to call it, of the variety *Talavera Belvuatis*.

I am inclined to think it to be faulty practice at best to sow grass seeds of any description among wheats, which appear to me to require all the nourishment the soil can afford them. I am prosecuting an experiment accurately to ascertain the truth of this, which, if this paper has not proved uninteresting, I may hereafter have the honour of reporting to you.

By referring to Specimen No. 7, it will be seen that the grain having been grown superficially, or on the broad-cast system, by a neighbour, and merely lightly harrowed in, the coronal and seminal roots appear crowded together, so, as it is presumed, to identify in some sort their offices, which, by the other mode, appear to be kept separate. This is a subject for further inquiry, as no positive conclusion has been arrived at; but as far as the structure of the plant seems to be a guide, it would appear to be clear that in certain seasons, and under peculiar states of the atmosphere, this crowding of the roots must prove prejudicial. The observation is made in order to invite attention to this point, in the hope that some inquiring mind will be led to make experiments on the subject.

In the collection now on the table, amounting to about 260 varieties, or subvarieties, is a fine selection of wheats, which I received from Mr. Loudon, which I greatly value, as coming from an individual so unwearied and so distinguished for his admirable labours. They were grown by M. Vilmorin of Paris, and presented by him to Mr. Loudon; and, as a classification, illustrative of the varieties described in the "Maison Rustique," are invaluable. I grew every sort last year. Some have greatly increased in size, being eight and nine inches long, two or three inches longer than their original types; but the moist weather which prevailed at the period of ripening, discoloured them so much as to destroy their beauty, and almost their resemblance to the parent.

J. LE COUTEUR.